

REMARKS

This is in response to the Office Action dated October 23, 2002.

In the Office Action the Examiner has rejected Claims 1, 3-13, 16-22 and 25 Under 35 USC § 103(a), based on US Patents' No. 5,506,772 to Kubozono et al., in view of US Patent No. 6,330,499 to Chou et al.

As understood, the Kubozono reference discloses an automotive testing system incorporating a sophisticated analyzer (technician station) controlled by an external computer, which regulates the test signals applied to the vehicle and analyzes the responsive signals generated by the vehicle. The external computer operates to carry out a statistical processing of the vehicle output. The computer is referred to as a "large-scale" computer (Column 3, Lines 65-68), or an artificial intelligence (AI) computer (Column 4, Line 13).

While systems such as that disclosed in the Kubozono reference indeed function to provide sophisticated diagnostic information to assist repairs, they require equally sophisticated analyzers operative to interface with artificial intelligence controllers and vehicles.

The Chou reference discloses an alternate system and method for vehicle diagnostics and health monitoring. As understood, the system disclosed in the Chou reference interfaces vehicle on-

board diagnostic systems with an on-board computer and cell phone to establish a two way communications link with a remote service center. As understood the diagnostic process may be initiated by detection of a trouble code, whereupon the information is displayed to a driver who may activate a communications link with a remote service provider.

Alternatively, the vehicle diagnostic systems may be hard-wired to facilitate bi-directional communication with the service center. In either case, the system appears to presuppose the presence of sophisticated storage, processing and display facilities within the vehicle to interface with the external service center (See Column 3, Lines 33-40, 46-53).

While such systems are useful to perform complex diagnostic functions, and provide useful interfaces with the drivers, they presuppose adaptation to sophisticated vehicles, and may be unsuitable for use in conjunction with many less expensive vehicles. Where the car to be serviced does not have sophisticated processing, storage and display facilities the technique disclosed in the Chou reference may also be unsuitable.

Alternatively, systems such as that described in Kubozono, appear to require a presence of sophisticated analyzers to interface vehicle diagnostic systems with very large external computers. In short, such systems are not practical for backyard mechanics who wish to service their own inexpensive vehicle, but

do not have access to sophisticating testing equipment as that disclosed in Kubozono.

What is needed is a simple, inexpensive technique diagnosing vehicles that may be implemented by unskilled users, on virtually any recent vehicle, without the need for expensive testing equipment or interfacing with sophisticated on-board processing systems.

The present invention provides a novel and non-obvious balance between the diagnostic capabilities and the required equipment and expertise. The present invention allows unskilled users to connect a conventional, hand carried code reader to a vehicle diagnostic port, remove the tool from the diagnostic port and quickly determine, without the need to access any external database, whether any additional investigation is necessary. If trouble codes are indicated, the invention allows the user to carry the tool to a convenient work station, e.g. a general purpose computer, wherein the trouble codes may be uploaded for interpretation and reference for repair. The tool is a simple read out device that extracts high level status information, and uplinks information extracted from the diagnostic port as may be useful.

As such, the present invention allows the uplink diagnostic functionality of a sophisticated vehicle diagnostic system, with only an inexpensive code reader. Uplink may be implemented using

the resources of a general purpose computer, which may be located remote from the vehicle, e.g. when the vehicle is not moveable. High level status information, which effectively gates the need for uplink diagnostic functionality, is provided in a simple light indicator. None of the cited references disclose or suggest such a convenient technique. Rather, the references appear to be directed more to sophisticated testing equipment and/or sophisticated vehicles having internal processing capability sufficient to implement complex instructions sets. As such, systems as disclosed in the cited references appear unsuited to general public application.

Applicant has amended the claims to more clearly specify that the code reader of the present invention is a wireless, hand held code reader. As understood, the prior neither discloses nor suggests such a code reader.

The claims have further been amended to specify that the passed/problem indicator is operative to generate an appropriate indication upon receipt of only the diagnostic trouble code signals from the vehicle on-board computer. The passed/problem indicator operates independent of any electrical connection to or communication with the personal computer or any other remote database.

As such, the present invention provides a code reader that is neither wired to the personal computer/technician station, nor

an electrical communication therewith as the code reader receives the vehicle codes and generates the initial indication signal. It is only in the event that the initial indicator signal provides a problem indication that the code reader is placed in electrical communication with a personal computer or other database operative to interpret the trouble code signals and generate responsive diagnostic information. Again, the prior art is not understood to disclose or suggest any such configuration, which provides significant advantage to backyard mechanics or others that cannot readily access expensive diagnostic equipment. However, the code reader of the present invention has the facility to interface with such expensive diagnostic equipment as may be necessary, upon indication of the trouble code.

Accordingly, claims are now believed to be in a condition for allowance. Should any outstanding matters remain, the Examiner is invited to contact Applicant's representative at the telephone number listed below.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made".

Application No. 09/961,223

If any additional fee is required, please charge Deposit
Account Number 19-4330.

Respectfully submitted,

Date: Dec 31, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Amended) A method of diagnosing a vehicle ~~via a remote computer, the vehicle~~ having an on-board computer for generating a diagnostic trouble code signal, the diagnostic trouble code signal being related to a passed or problem status of the vehicle ~~or a problem status of the vehicle~~, the method comprising:

- (a) connecting a ~~portable wireless, hand held~~ code reader to the on-board computer;
- (b) communicating diagnostic trouble code signals from the on-board computer to the code reader;
- (c) disconnecting the code reader from the on-board computer;
- (d) generating a visual output signal representative of the passed or problem status of the vehicle;
- (e) in the event that the visual output signal indicates a problem status only, then connecting the code reader to a personal computer;
- (f) communicating from the code reader to a personal computer respective ones of the diagnostic trouble code signals which are related to a problem status of the vehicle;

~~(d)~~(g) communicating the respective ones of the diagnostic trouble code signals which are related to a problem status of the vehicle from the personal computer to a remote computer, the remote computer being configured to correlate the diagnostic trouble code signals to problem description data for diagnosing the vehicle; and

~~(e)~~(h) communicating from the remote computer to the personal computer problem description data correlated to the respective ones of the diagnostic trouble code signals related to a problem status of the vehicle.

4. (Amended) The method of Claim 1 wherein (a) comprises utilizing a cable connection for communicating with the on-board computer, in a read only mode, using the code reader.

13. (Amended) A vehicle diagnosis system for diagnosing a status of a vehicle, the vehicle having an on-board computer for generating diagnostic trouble code signals, the diagnostic trouble code signals being related to a passed status of the vehicle or a problem status of the vehicle, the system comprising:

a portable wireless, hand held code reader configured to electronically communicate with the on-board computer, in

a read only mode, for receiving diagnostic trouble code signals from the on-board computer, the code reader having an output device for indicating a passed or problem status of the vehicle in response to only receipt of the diagnostic trouble code signals from the on-board computer; and

a personal computer configured to electronically communicate with the code reader, in a read only mode, for receiving from the code reader diagnostic trouble code signals related to a problem status of the vehicle, the personal computer having a remote electronic communications interface, the remote electronic communications interface being configured to establish an electronic communications link between the personal computer and a remote computer for transmitting the diagnostic trouble code signals to the remote computer.

22. (Amended) A portable code reader for diagnosing a status of a vehicle, the vehicle having an on-board computer for generating a diagnostic trouble code signals, the diagnostic trouble code signals being related to a passed status of the vehicle or a problem status of the vehicle, the code reader comprising:

an on-board computer connection interface configured to

electronically communicate with the on-board computer, in a read only mode, for receiving diagnostic trouble code signals from the on-board computer;

an output device configured to indicate a passed or a problem status of the vehicle in response to receipt of the diagnostic trouble code signals from the on-board computer and an inconclusive status of the vehicle in response to a failure to receive a diagnostic trouble code signals from the on-board computer;

a code reader memory configured to store diagnostic trouble code signals received from the on-board computer connection interface related to a problem status of the vehicle; and

a personal computer connection interface configured to electronically communicate with a personal computer, in a read only mode, for transmitting the stored diagnostic trouble code signals ~~indicative of a problem status stored in the code reader memory for diagnosing the vehicle. after the computer connection interface is removed from connection to the on-board computer.~~

26. (New) The method as recited in Claim 1 wherein the step of generating a visual output signal proceed independent of

any communication with the personal computer.

27. (New) The system as recited in Claim 13, wherein the output device indicates a passed or problem status of which is independent of any communication with the personal computer.

28. (New) The code reader as recited in Claim 22, wherein the output device indicates a passed or problem status of the which independent of any connection to the personal computer.